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Control of Exposed Soil on Road Banks

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Within the Southern Appalachian Mountain region, road construction exposes the soil on many road cuts and fills. Open winters, with repeated freezing and thawing, accompanied by heavy winter and spring rains, favor active erosion of this exposed soil. Six to twelve inches of bank soil is not an unusual amount to be lost from a steep bank during a single season. Similarly, erosion is active on loose fills. This failure of the soil exposed by road construction to remain in place increases the cost of road maintenance. Also, the eroded soil washed into the streams tends to fill up the natural channels and to have a detrimental effect upon feeding conditions for game fish. Exposed banks are an unsightly drawback to roadside appearance.

Road banks should be covered with litter or debris or planted to vegetation at the time of road construction. Road bank control in this manner must be considered only as a supplement to good road construction. It does not take the place of adequate berme and drainboard construction, and other standard practices for controlling road water. Road bank control and planting does serve three major purposes: 1. reduction of road maintenance costs, 2. improvement of roadside appearance, and 3. reduction of the amount of eroded soil carried into ditches and streams.

In tests carried out by the Appalachian Forest Experiment Station, the most practical and simplest procedures that have proven successful for road bank control are as follows:

Root clumps of honeysuckle may be set either in furrows dug along the contour or in holes dug into the bank and filled with top soil.

Sod strips of common sod-forming grasses may be set in furrows dug along the contour. Although spring is the most favorable season, transplanting may be done any time except during very dry seasons.

Grass seed at the rate of 20 pounds per acre may be sown in the spring or early summer on loose fills and shoulders. It should be carefully raked in together with a complete 4-8-4 fertilizer at the rate of 400 pounds per acre. The grass species used should be the important sod grasses of the locality.

On long fill slopes of particularly loose soil, stake and brush wattles may be used for holding the soil until vegetation has become established.

On dry, sterile slopes, brush and litter may be staked on the slope to conserve moisture and favor vegetation establishment. South facing banks of dry, sterile subsoil cannot be planted with any degree of success without first improving moisture and shade conditions of the soil.

In forested areas where an abundance of woods litter and debris is present, this may be raked down upon road banks with little difficulty. This procedure is one of the simplest and most successful methods of protecting bare soil, but it is impractical on slopes of more than 1-1. To catch and hold the litter in place, it is necessary to dig contour furrows or to set small stakes at random or in contour rows. The litter, also, may be scattered and then weighted down with poles, stones, or light brush. Using this method of holding litter raked on to the slope, natural vegetation will generally establish itself, and no planting will be necessary.

Road cuts through deep soil that are to be planted should be brought at least to a 1-1 slope, and loose soil fills should be constructed to have at least a $1\frac{1}{2}$ -1 slope. Cuts through stiff clay soil will stand for a time at less than a 1-1 slope, but, as a rule, surface freezing action will throw down the bank soil until it rests at a natural angle of repose. Where roots are present in the soil above a cut, an unsightly overhang may be developed. To avoid this possibility, it is better to round off the top shoulder of the cut, removing the vegetation from the soil for several feet back from the face.

The selection of plant species for road planting must be governed by the following rules: Vegetation must not create a fire hazard; it must be easy to establish without requiring a large amount of moisture; it must be rapid and vigorous growing, without becoming a nuisance on adjoining lands; it must be easily available in large amounts, or easily propagated, and it should be reasonably attractive for landscaping, preferably an evergreen. Common honeysuckle comes near answering all these requirements as any other plant. English ivy will stand shade on moist, north slopes. Kudzu has been found to be a vigorous growing plant in many localities. It is not an evergreen, however, and frequently becomes a weed on adjacent land areas, and, as a whole, is less desirable than honeysuckle. Dewberries, blackberries, and snowberries are all good bank control species.

At the base of long fills where moisture is present and where low trees are not undesirable, willow cuttings can be used. The cuttings, made while the wood is dormant, should be 18 to 30 inches long and should be set in the soil at least three-fourths of their length.

The accompanying diagrams illustrate successful methods of road bank control. These methods must be adapted to specific local problems at hand, and all of them call for independent judgment on the part of the foreman in charge. In general, heavy mechanical structures should be kept to a minimum. This applies particularly to stake and brush wattle construction. Woods litter and debris from the forest floor raked on to a bank and held by simple mechanical devices is one of the very best methods by which soil washing may be prevented and vegetation established. This inexpensive procedure should always be used whenever relatively unfertile soil is encountered.



Fig. 1. Newly constructed machine built back slope. Dotted line indicates better slope for planting. A and B critical shoulders to be removed.



Fig. 2. Old backslope. Dotted line indicates better slope for planting.



Fig. 3. Sod strips or transplants set in holes or furrows filled with top soil. For back slope or fill.

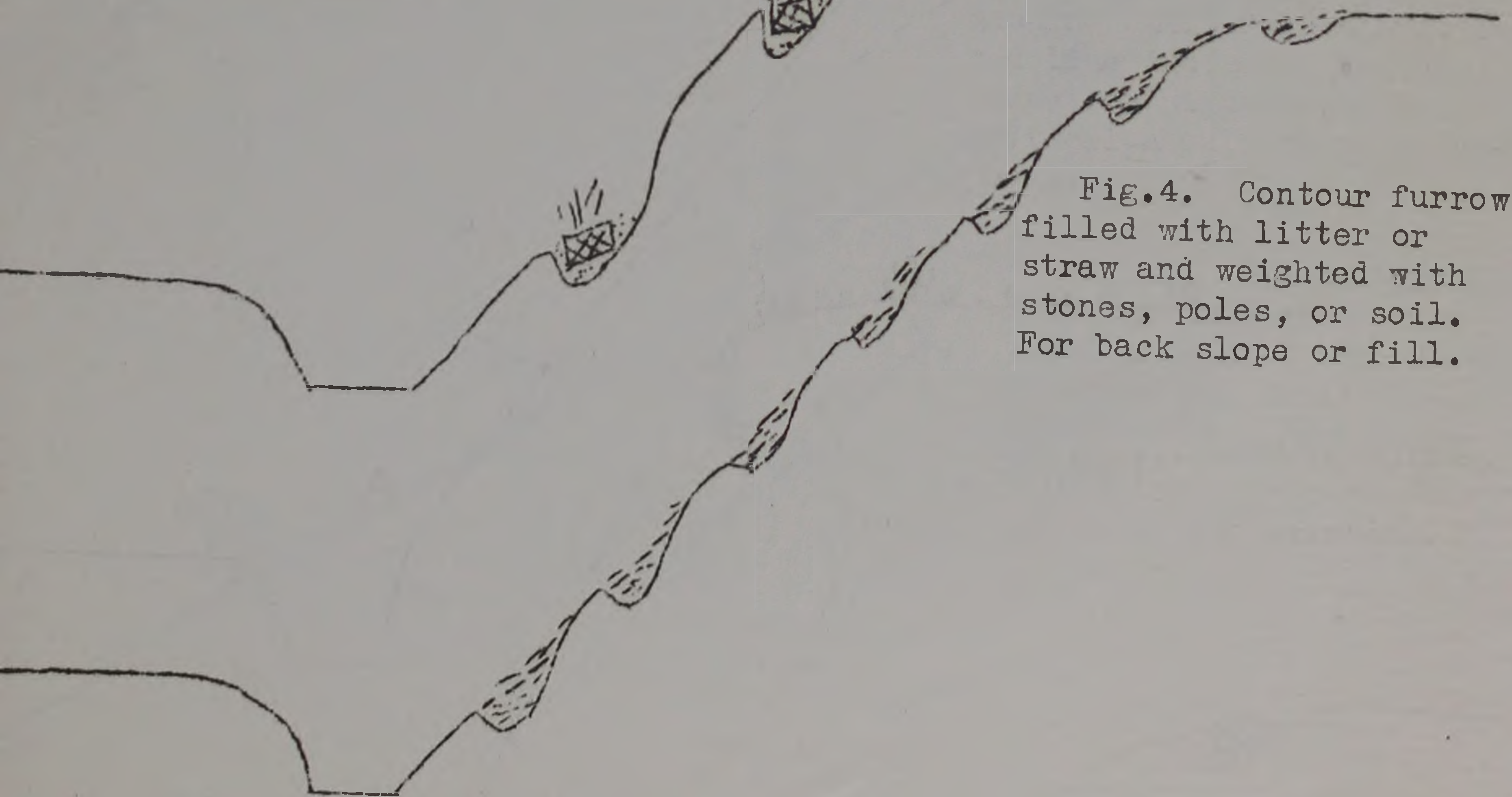


Fig. 4. Contour furrows filled with litter or straw and weighted with stones, poles, or soil. For back slope or fill.

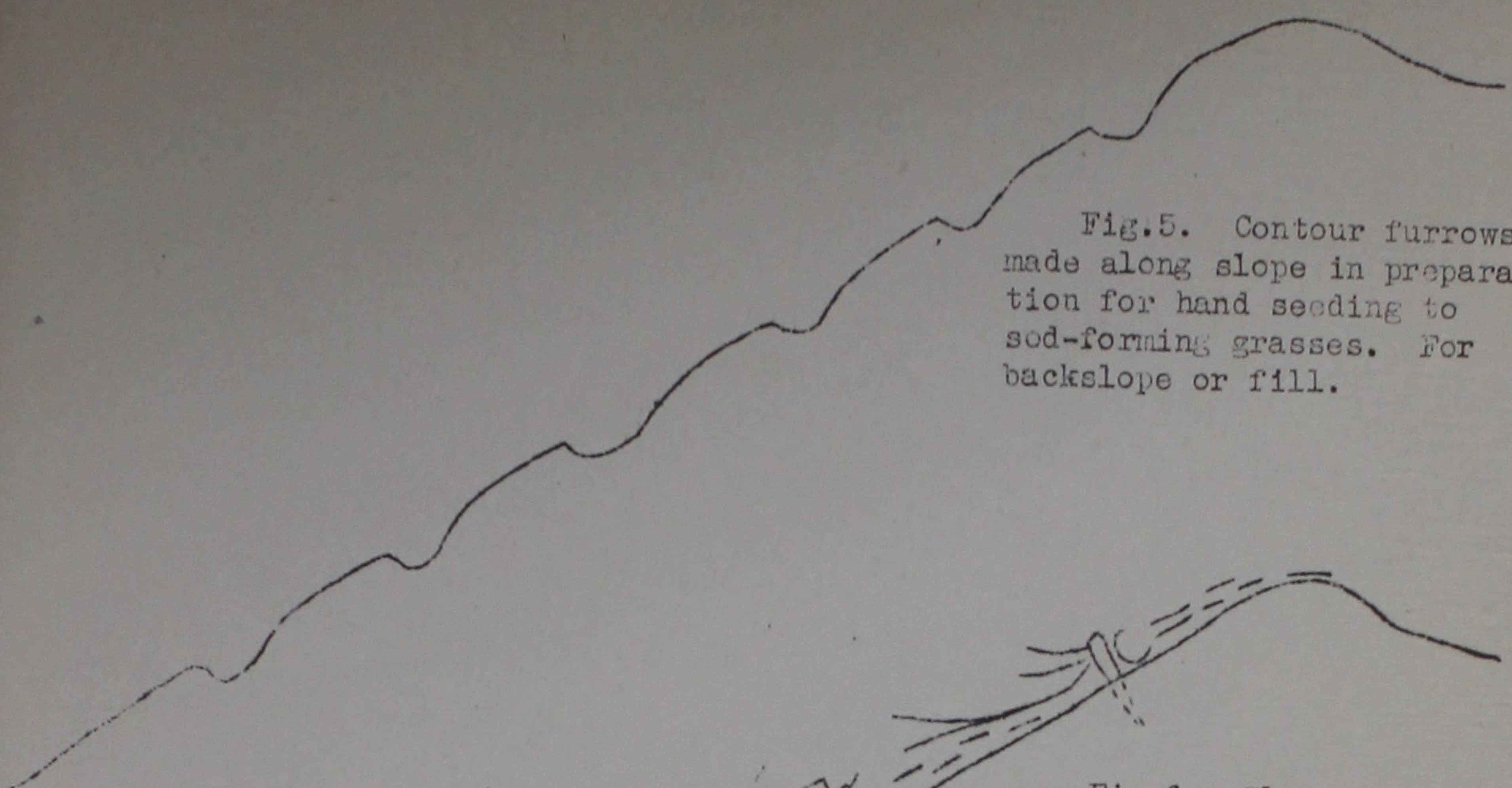


Fig.5. Contour furrows made along slope in preparation for hand seeding to sod-forming grasses. For backslope or fill.

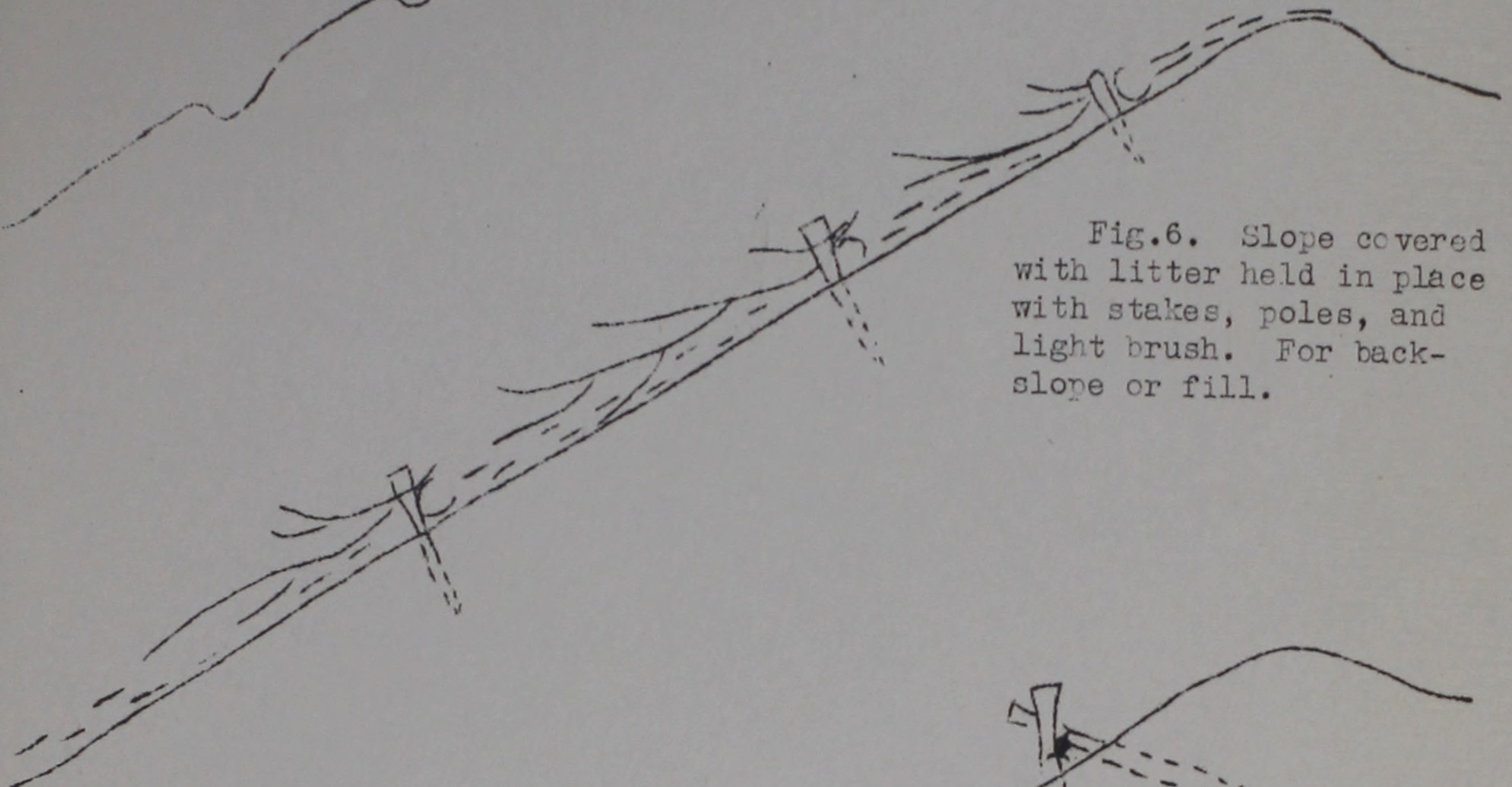


Fig.6. Slope covered with litter held in place with stakes, poles, and light brush. For backslope or fill.

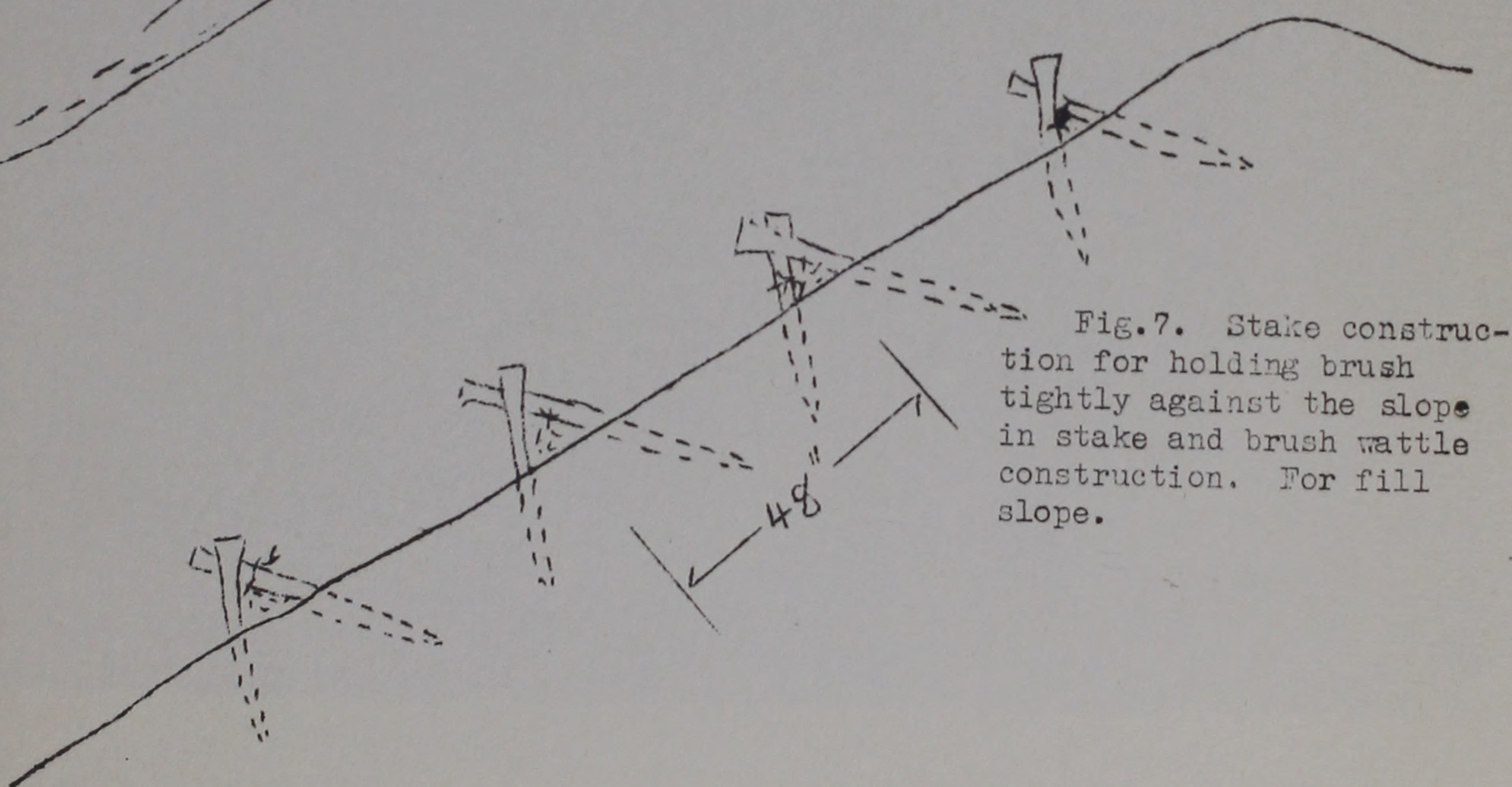


Fig.7. Stake construction for holding brush tightly against the slope in stake and brush wattle construction. For fill slope.